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## 1. Introduction

Work Package 5 comprises a series of case studies in 5 separate categories:

- Agricultural/Feedstock Supply
- Waste Recycling/Collection and Biogas
- Production Facilities
- End Use
- Promotion/Awareness Campaigns.

This report outlines the case studies that will be undertaken by each of the project regions.

## **2. Merseytravel, UK**

### **5.1 Agricultural / Feedstock Supply**

No tasks in this section

### **5.2 Waste Recycling / Collection and Biogas**

No tasks in this section

### **5.3 Production Facilities**

No tasks in this section

### **5.4 End Use**

In line with the information outlined in the project brief, Merseytravel will provide a case study following a trial of B20 in a public sector fleet. It was initially proposed that this trial would take place using the Mersey Tunnels fleet of vehicles but this is no longer possible so an alternative has been identified.

Mersey Tunnels were originally identified as being suitable for the trial as they have on site fuel bunkering and are owned and operated by Merseytravel. Following the start of the BIONIC project a wide ranging review of Merseytravel's activities identified the area currently occupied by the fuel bunker as a development area. Following a senior level review it was decided that the fuel bunker will be removed. This made the planned case study impossible to deliver.

In order to fulfil the requirements of the case study Merseytravel sought to identify an alternative fleet in the region. The chosen fleet is operated by Wirral Metropolitan Borough Council which is the third largest in the North West. This will meet the essential criteria of the case study by providing a public sector fleet with 40 vehicles operating on B20.

The vehicles involved in the trial are subject to tender in April 2009. In order to mitigate the risk of the vehicles not being retained the trial has started early so that at least one year's data will be available.

The outputs from the case study will be two fold. Firstly data will be collected for the duration of the trial which will include fuel consumption logging before and during the trial. Secondly qualitative information will be included to provide a fully rounded report of the experiences from the trial.

### **5.5 Promotion / Awareness Campaigns**



## 4.2 Detailed definition of case study tasks in each region

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Merseytravel currently manages the ECOtravel Bureau ([www.ecotravel.org.uk](http://www.ecotravel.org.uk)) which is primarily a web based information Bureau providing free information and advice on cleaner vehicles and fuels to both the public and business communities on Merseyside. The website will be expanded to provide a specific area on sustainable biofuels which will provide information on currently available sustainably produced sources in the region and explain the difference between sustainably produced and none sustainably produced biofuels. In addition the news section of the website will carry relevant biofuel news.

Merseytravel will manage the North West Biofuels User Group. This group is aimed specifically at fleet users in the North West of England and provides a platform for experience to be shared between current users, potential users and producers. The Group will meet on a quarterly basis and there will be an expert speaker at each meeting to provide up to date information on topics of interest.

Merseytravel were co organisers of the North West's largest dedicated green vehicle show in June 2008 aimed specifically at the business community. The event, Green Car Guide Live! 2008, was attended by more than 500 people and attracted local press coverage and regional radio and television news coverage. Within the event technical seminars and workshops were undertaken including two seminars on the BIONIC project.

The event showcased more than 40 vehicles including high blend biodiesel and CNG/biomethane compatible vehicles. It is hoped to have another event during the time of BIONIC but this is dependent on several factors. The most important of these are that it is very resource intensive both in terms of staff time and costs in excess of €75,000. In addition there is no internal budget for the event so all of the funding has to be sourced externally. Each time the event is held suitable funding must be found.

### **3. Lancashire County, UK**

#### **5.1 Agricultural / Feedstock Supply**

No tasks in this section

#### **5.2 Waste Recycling / Collection and Biogas**

Case Study Two: Waste Oil, Dexter Paints. Located in Burnley, Dexter paints have diversified their business and have been processing waste vegetable oil into bio diesel for some time. The company has also begun to process rape seed oil into bio diesel however the rape oil they source is presently imported from China. They are interested in creating a Lancashire supply network if there is demand for a more ethically sourced bio diesel supply within the county. The case study will investigate the potential to develop a Lancashire rape oil supply network and an end market for a Lancashire sourced and processed product

#### **5.3 Production Facilities**

Case Study One: Stalmine Bio diesel plant - As part of the economic assessment of bio diesel production Stalmine will be used as a case study. The business is a consortium of West Lancashire Farmers who have come together to develop a bio diesel plant at Stalmine. The business has not developed beyond the planning stage due to the increasing cost of rape oil. The case study will investigate the economic barriers associated with this business and provide a model which will identify the margin between diesel price and rape oil price at which the business would be viable.

#### **5.4 End Use**

Case Study Three: Biogas as a transport fuel source in Lancashire.

- Identify the potential to produce biogas within the county.
- Identify the key blockages to the development of Biogas within Lancashire.
- Provide an economic assessment of biogas derived transport fuel compared to bio diesel.
- Assess the fuel demand of the Lancashire County fleet and make recommendations as to the most appropriate source of biofuel based on both the economic and ethical issues identified.
- Undertake a promotion and awareness campaign to highlight the Bionic project and its findings.

## 5.5 Promotion / Awareness Campaigns

Lancashire County Council will:

1. Establish local contacts from both producer and user groups predominantly through the case studies involving the LCC Fleet , farming communities and other local interest groups.
2. Spread news of both the BIONIC programme and progress on findings via:
  - Local and National distribution of brochures etc. in line with Merseytravel.
  - Lancashire County Council website to raise awareness of the production and use of Biofuels in Lancashire.
  - Extension of the LCC Climate Change website <http://www.lancashire.gov.uk/environment/envpolicy/climate/> to include aspects of both the BIONIC programme and the use of Biofuels in Lancashire.
  - General working contacts with National and Regional links e.g. Defra and Regional Rural groups to disseminate progress and findings.
  - Direct contact with farming and rural communities through the Lancashire Rural facilitation Service - Rural Futures, Forest of Bowland (AONB) teams etc.
  - Direct contact with Public Sector organisations via the Fleet case study.
  - Use of local media and LCC Publications as appropriate.
3. Contribute to the organisation of events in line with Merseytravel.
4. Host study/technical tours in line with Merseytravel.
5. Produce, print and distribute Best Practice Guidelines as indicated in WP6.

## 4. Region Värmland, Sweden

### 5.1 Develop Agricultural / Feedstock Supply Case Studies

A case study will be made about the use agricultural feedstock for the production of biofuels including exploring the possibility for cross-regional cooperation in Sweden. This case study will show the possibilities and limitations of a mainly forest region to make use of agricultural feedstock to produce biofuels like RME.

- Available agricultural area for energy crops production and the amounts of biodiesel that can be produced
- Climatologically restriction for the production of energy crops
- Biofuel production and future possibilities
- Alternatives

### 5.2 Develop Waste Recycling / Collection and Biogas Case Studies

This case study will present a description of the potential for waste recycling to produce biogas, and its application in local and regional person transport systems in the urban areas of the region.

In the case study the process and development of the Karlstad City Bio Gas project will be described, as well as the building of the regeneration installation to make the bio gas suitable for use in vehicles. It will present the legal requirements, the financial requirements (and financial support), the political process, the importance of political engagement and the role of fleet owners, car manufacturers and end users.

### 5.3 Develop Production Facility Case Studies

Explore the possibilities of using black liquor from the forestry and paper industries in Värmland for production of biofuels. This study will focus mainly on the barriers that exist to using these resources.

Black liquor is a [by product](#) of the [Kraft process](#), (also known as Kraft pulping or sulphate process) during the production of [paper pulp](#). Wood is decomposed into [cellulose](#) fibres (from which [paper](#) is made), [hemi cellulose](#) and [lignin](#) fragments. Black liquor is an aqueous solution of lignin residues, hemi cellulose, and the inorganic chemicals used in the process.

Black liquor gasification is a promising alternative for recovery of energy and chemicals from spent pulping liquor (black liquor) in the pulp and paper industry.

## 4.2 Detailed definition of case study tasks in each region

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Because the organic fraction of black liquor comes from biomass, it is a carbon-neutral fuel and is classified as a renewable energy resource. Large-scale adoption of black liquor gasification technology in an integrated gasification combined-cycle (IGCC) configuration would allow production of a lot of megawatts of green electricity. Alternately, the synthesis gas produced from black liquor gasification can be used as feedstock for production of automotive fuels (e.g. bio ethanol and biodiesel).

### **5.4/5.5 Develop End Use Case Studies/ Promotional Campaign Case Studies**

This case study will be a combined study concerning tasks 5.4 and 5.5, because they are strongly linked to each other. It will review previous initiatives to end users, executed in the last two years. It will amongst other things describe the role of local authorities in promoting biofuel car for transport application by investing in biofuel and hybrid cars. Furthermore a description will be made concerning already existing activities concerning promoting the use of biofuels in transport applications. These activities have already led to booming sales of biofuel driven cars in the region in particular and in Sweden in general (boosting sales by over 400% in 2006).

Within the Region of Värmland more campaigns and promotional activities will be developed with greater attention paid to the possibilities of using more environmental biofuels in transport applications in the region. If possible these activities will be combined with already planned dissemination activities.

## **5. Ploiesti Municipality, Romania**

### **5.1 Agricultural / Feedstock Supply**

Our region has limited possibilities for energy crops production. There is a strong need of gathering and centralizing the data about the surfaces available for energy crops production. Alternatives will be explored also.

### **5.2 Waste Recycling / Collection and Biogas**

It will be investigated the regional market in order to obtain data about the waste cooking oil potential in order to develop a recycling network and to transform this waste in biodiesel. The municipality will ask of all potential cooking oil users to present a situation about the waste cooking oil obtained in the cooking process. The collected data will be used in order to establish a collection procedure and then to assure the transport and the storage of this waste. Finally, the waste oil will be sent to the biodiesel producers for recycling.

### **5.3 Production Facilities**

No tasks in this section.

### **5.4 End Use**

Starting with October we will undertake a test with B10-B30 (Biodiesel 10% to 30% in Diesel fuel) in some buses in the local public transport network. The mixed fuel will be analysed in order to establish correlations between fuels' characteristics, engine behaviour and emissions. The test will offer as more information about the behaviour of the biodiesel in different operational conditions, as: type of engine, type of injection system, temperature of fuel, outside temperature and humidity etc. The obtained data will be presented in local workshops, in local media and at national and international conferences.

### **5.5 Promotion / Awareness Campaigns**

Our project (objectives, tasks, targets and results) will be presented as a poster to the 6-th International Conference of South-Eastern Chemical Societies (ICOSECS-6) organised by Bulgarian Chemical Society in Sofia (10-14 September 2008). The participation will be very large from all countries of Balkan region (Greece, Cyprus, Bulgaria, Serbia, Albania, Montenegro, Bosnia, Macedonia, Slovenia and Romania).

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Another activity, previewed for October 2008, is a workshop with all our partners participating to the BIONIC local network for a session of the project progress presentation, followed by an analysis regarding the present situation of biofuels in Romania. Finally, the participants will be informed about the next steps and actions within the frame of BIONIC project.

## **6. CTL Cantabria, Spain**

### **5.1 Agricultural / Feedstock Supply**

No tasks in this section

### **5.2 Waste Recycling / Collection and Biogas**

No tasks in this section

### **5.3 Production Facilities**

In 2006 when the proposal document was sent for its approval it was foreseen that at least two biofuel production plants would be built in Cantabria.

Unfortunately, one of the projects was interrupted due to legal reasons referred to land property and licences. CTL Cantabria will study this case in detail as well as two more projects which were bid by the Port of Santander but received no offers from the biofuel production companies.

The second plant we will analyse will be the bioethanol production facility in Torrelavega. We will study legal and financial requirements, raw material supply, biofuel destination and transport, etc....

Currently, the Environment Department of the Regional Government has finally decided to concede environmental licence to the company Sniace Biofuels for the building of the bioethanol plant. This resolution means the first step in the construction of the new facility which has an estimated production capacity of 100.000 tons/year. Sniace Biofuels announced in March that the plant will be operative in 2010 after having been invested 100 million euros in its development.

### **5.4 End Use**

The Government of Cantabria will launch an incentive program to promote biofuel in captive fleet of public transport. From this program, in addition to the promotion of biofuels among end users, we will learn from bus operator experiences in order to spread the information to other sectors of the society.

### **5.5 Promotion / Awareness Campaigns**



## 4.2 Detailed definition of case study tasks in each region

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Promotional public events will include the “BioBus”, buses painted with images related to biofuel as a way to promote the use of biofuel. The expected result of all these efforts is to achieve social awareness of the advantages of using biofuel instead of traditional fuel for the environment, both for regional and global sustainability.

Finally, two vehicles dedicated to the promotion of public transport and biofuels, will begin to circulate on August 4th, as part of the BIONIC project. The public contest was awarded by the Regional Government on June 24 to the bus company Astibus which belongs to the National Express Group. The project will last 24 months and its estimated that about 2.000.000 passengers will use these vehicles,

The BIOBUS buses will show placards and video tapes related to climate change, global warming, private transport effects or biofuel benefits and will operate in the most used public transport routes which connect Santander, (Cantabria capital city) with its suburban area. In addition to public transport services the bus will offer leisure routes to environmental strategic places in order to promote the environmental benefits of public transport and biofuels.

## **7. Pazardijk, Bulgaria**

### **5.1 Agricultural / Feedstock Supply**

The following tasks will be performed in this case study:

1. Analysis of soils and climate conditions in the region, their conformity for growing energy crops. The specific agricultural requirements for growing energy crops will also be studied. This task will be performed with the assistance of the Institute for soil science “N. Pushkarov”, and the Bulgarian Farmers Association.

As a result a database, containing the following data will be generated:

- climate conditions
  - sorts of agricultural lands
  - soil characteristics
  - uncultivated lands
2. An estimation of energy crops which are suitable for growing will be performed.
  3. Analysis of renewable energy potential in the region.
  4. Discussions and proposals in the Regional Committee for EE and RES.

### **5.2 Waste Recycling / Collection and Biogas**

The following tasks will be performed in this case study:

1. Development of database for:
    - Forest biomass and wood residues from wood-processing industry;
    - Wastes from agriculture and farming;
    - Rural wastes.
  2. Estimation of the real wastes potential for production of biogas.
  3. Study of best European practices applicable and or adaptable to local context. A brochure will be developed in order to raise awareness amongst local farmers.
  4. Discussions and proposals in the Regional Committee for EE and RES.
- This case study will be developed with the assistance of Regional Government of Pazardjik District, and Energy Agency of Plovdiv.

### **5.3 Production Facilities**

No tasks in this section

### **5.4 End Use**

No tasks in this section

### **5.5 Promotion / Awareness Campaigns**

#### 4.2 Detailed definition of case study tasks in each region

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REAP will organize awareness-raising campaign for mobilizing bio-fuel end users through:

- Dissemination of informational materials (brochures, leaflets, publications in newspapers) to local and regional authorities, stakeholders, key players, and end users.
- Organization of thematic seminar (work shop) at which representatives of local and regional authorities will be invited as well as industrial representatives.
- Discussions and proposals in the Regional Committee for EE and RES.